REMARKS

Claims 1-5, 8-11, 13-14, 16 and 18-19 are pending in the present case. Claims 1, 9 and 14 are independent. Claims 12, 17, and 20 were withdrawn from consideration by the Examiner. Claims 6-7 and 15 were cancelled by Applicants. Claims 1, 9 and 14 are amended herein. Applicants respectfully request continuing examination in view of the above amendments to the present application, and the arguments set forth below. No new matter is added herein.

CLAIM REJECTIONS

35 USC § 102 - Widmayer Reference

Claims 1-5, 8-11, 13-14, 16 and 18-19 are rejected under 35 USC 102(b) over US Patent No. 5,582,240 to Widmayer (hereinafter Widmayer). Applicants have reviewed the Widmayer reference and respectfully assert that it does not teach or suggest the embodiments of the present invention recited in Claims 1-5, 8-11, 13-14, 16 and 18-19 for the following rationale.

The teachings of Widmayer and the embodiments of the present invention recited in Claims 1-5, 8-11, 13-14, 16 and 18-19 differ. As Applicants understand the reference, Widmayer teaches a pneumatically coupled heat sink assembly for multiple, juxtaposed heat sinks. Widmayer at col. 2, l. 4-6. Pneumatic pathways, at least two of which are non-parallel, are operably coupled therein with similar ones of adjacent heat sinks. Id. at ll. 6-11. Widmayer's teachings relating to this pneumatically coupled heat sink assembly differs from the claimed embodiments recited herein.

As amended herein, independent Claim 1 reads as sown below, with underlining added for emphasis.

14. A method for removing heat from an electronic component, comprising:

directing a plurality of flow streams of a fluid medium in unique directions towards first ends of at least two sets of a plurality of fins of an appurtenance coupled to a heat sink and disposed to conduct heat from said electronic component; and

changing said direction within substantially even spaces between said fins towards a second end of said sets of fins opposite from said first end, wherein said flow streams receive motive force from a plurality of fans and comprise discharges thereof wherein said fans are disposed and direct said discharges in said unique directions substantially horizontally with respect to said first end of said fins and into said spaces.

Independent Claims 1 and 9 are amended herein after a similar fashion with Claim 14. As amended herein, Claims 14, 1 and 9 recite that a plurality of flow streams of a cooling fluid medium (e.g., air or another gaseous cooling medium) are directed in unique directions towards first ends of separate sets of fins of an appurtenance coupled to a heat sink. The direction of each of the flow streams is changed within substantially even spaces between the fins. The flow streams comprise discharges of a plurality of fans from which they receive a motive force and are directed in the unique directions substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins.

Providing motive force to multiple cooling flow streams discharged from multiple fans, directing these flow streams substantially horizontally in unique directions and into substantially even spaces between fins of multiple sets of cooling fins in which their direction of flow is changed, as recited by Claims 14, 1 and 9 herein provides the benefit of redundant cooling flow across the finned surfaces, for instance, in the event of the failure of one of the fans. While conventionally, co-axially mounted multiple fans are used for redundancy, common fan failure modes such as seized bearings can restrict the air flow from the remaining operational fan (e.g., with aerodynamic resistance, drag, etc.) which can lead to inadequate cooling flow. The cooling flow schemes provided by the claimed embodiments recited herein however retain their beneficial redundancy

even in the face of such common fan failure modes. Thus, the claimed embodiments recited herein provide the advantage of increased reliability, for instance, in electronic equipment such as enterprise servers and other installations, applications, etc., where uninterrupted operation can be important.

Applicants find no teaching or suggestion in Widmayer directed towards flow streams comprising discharges of a plurality of fans from which they receive a motive force and are directed substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins, as recited by Claims 14, 1 and 9 herein. For at least this reason therefore, Applicants respectfully assert that the Widmayer reference does not teach or suggest the embodiments recited by Claims 14, 1 and 9 and their respective dependent claims and that thus, these claims are allowable over the Widmayer reference under 35 USC 102(b).

Moreover, Applicants note that Widmayer also expressly teaches that but a single fan generates an "air flow, which flows substantially perpendicular to the convective surface" (Id. at ll. 19-21) and that the flow paths are "directed towards the periphery of the heat sink of the heat sink." Id. at ll. 23-27. As clearly shown in Widmayer's Figure 1, the single air flow approaches the heat sink perpendicularly from above. Thus, the heat sink teaching of the Widmayer reference cannot provide the redundant cooling flow benefit that is provided by the claimed embodiments recited herein. Further, Applicants respectfully assert that these express teachings of the Widmayer reference explicitly teach away from the flow streams comprising discharges of a plurality of fans from which they receive a motive force and are directed substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins, as recited by Claims 14, 1 and 9 herein. For this additional reason, Applicants respectfully assert that the Widmayer reference does not teach or suggest the

embodiments recited by Claims 14, 1 and 9 and their respective dependent claims or provide motivation to produce these claimed embodiments recited herein and thus, that these claims are allowable over the cited reference under 35 USC 102(b).

35 USC § 102 - Horng Reference

Claims 1-5, 8-11, 13-14, 16 and 18-19 are rejected under 35 USC 102(e) over US Patent No. 6,697,256 to Horng, et al. (hereinafter Horng). Applicants have reviewed the Horng reference and respectfully assert that it does not teach or suggest the embodiments of the present invention recited in Claims 1-5, 8-11, 13-14, 16 and 18-19 for the following rationale.

The teachings of Horng and the embodiments of the present invention recited in Claims 1-5, 8-11, 13-14, 16 and 18-19 differ. As Applicants understand the reference, Horng teaches a device for attaching a heat sink to a board-mounted heat producer. Horng at col. 1, ll. 5-10, ll. 35-40, ll. 42-45; col. 2, ll. 20-25; col. 4, ll. 14-56. Horng's teachings relating to a device for mounting heat sink differs from the claimed embodiments recited herein.

Applicants respectfully repeat the discussion and arguments asserted above relating to Claims 14, 1 and 9 and their respective dependent claims made in reference to Widmayer. As amended herein, Claims 14, 1 and 9 recite that flow streams comprising discharges of a plurality of fans from which they receive a motive force and are directed substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins. These claimed embodiments have benefits relating to redundant cooling flow, which has advantages related to operational reliability, as discussed above.

Applicants find no teaching or suggestion in Horng directed towards flow streams comprising discharges of a plurality of fans from which they receive a motive force and are directed substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins, as recited by Claims 14, 1 and 9 herein. For at least this reason therefore, Applicants respectfully assert that the Horng reference does not teach or suggest the embodiments recited by Claims 14, 1 and 9 and their respective dependent claims and that thus, these claims are allowable over the Horng reference under 35 USC 102(e).

Moreover, Applicants note that Horng also expressly teaches in its "preferred embodiment" (Id. at col. 2, ll. 22-23) that but a single fan is provided with a main body of a heat sink (Id. at ll. 26-27) and that this single fan is "for dissipating heat air [sic] around plural fins. Id. at l. 26. Horng also expressly teaches that it is preferable that a detachable cover covers the main heat sink body. Id. at 27-30. Further, Horng's Figures 2 and 5 clearly show (1) but a single fan taught therein that is disposed (2) vertically (i.e., perpendicularly) with respect to the fins in (3) a somewhat centralized orientation with respect to the flow-facing ends of the heat sink's (4) single fin array and (5) provides but a single air flow that (6) dissipates heated air around (Id. at l. 26) the single fin array. Thus, the heat sink teaching of the Horng reference cannot provide the redundant cooling flow benefit that is provided by the claimed embodiments recited herein.

Further, Applicants respectfully assert that these express teachings of the Horng reference explicitly teach away from the embodiments recited herein, which relate to (1) a plurality of fans that are disposed to discharge (2) substantially horizontally with respect to the fins, (3) the fans' discharges providing motive force for flow streams substantially horizontally into first ends of (4) a plurality of sets of fins to comprise (5) multiple, separate cooling flow

streams, each flow stream flowing through (e.g., from the first end to the second end of the) substantially even spaces between the fins of multiple fins sets, as effectively recited by Claims 14, 1 and 9 herein. For this additional reason, Applicants respectfully assert that the Horng reference does not teach or suggest the embodiments recited by Claims 14, 1 and 9 and their respective dependent claims or provide motivation to produce these claimed embodiments recited herein and thus, that these claims are allowable over the cited reference under 35 USC 102(e).

35 USC §§ 102, 103 - Suntio Reference

Claims 1-5, 8-11, 13-14, 16 and 18-19 are rejected under 35 USC 102(b) or in the alternative, under 35 USC 103(a) over US Patent No. 6,313,399 to Suntio, et al. (hereinafter Suntio). Applicants have reviewed the Suntio reference and respectfully assert that it does not teach or suggest the embodiments of the present invention recited in Claims 1-5, 8-11, 13-14, 16 and 18-19 or provide motivation to produce these claimed embodiments recited herein for the following rationale.

The teachings of Suntio and the embodiments of the present invention recited in Claims 1-5, 8-11, 13-14, 16 and 18-19 differ. As Applicants understand the reference, Suntio teaches a cooling element for cooling unevenly distributed heat loads. Suntio at col. 1, ll. 5-8, ll. 62-64. Suntio's teachings relating to this cooling element differ from the claimed embodiments recited herein.

Applicants respectfully repeat the discussion and arguments asserted above relating to Claims 14, 1 and 9 and their respective dependent claims made in reference to Widmayer. As amended herein, Claims 14, 1 and 9 recite that flow streams comprising discharges of a plurality of fans from which they

receive a motive force and are directed in unique directions substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins. These claimed embodiments have benefits relating to redundant cooling flow, which has advantages related to operational reliability, as discussed above.

Applicants find no teaching or suggestion in Suntio directed towards flow streams comprising discharges of a plurality of fans from which they actively receive motive force and are directed in unique directions substantially horizontally with respect to the first end of the fins into the substantially even spaces between the fins, as recited by Claims 14, 1 and 9 herein. For at least this reason therefore, Applicants respectfully assert that the Suntio reference does not teach or suggest the embodiments recited by Claims 14, 1 and 9 and their respective dependent claims and expresses or implies no motivation to provide these claimed embodiments recited herein and that thus, these claims are allowable over the Suntio reference under 35 USC 102(b) and/or 35 USC 103(a).

Moreover, Applicants note that Suntio also expressly teaches that "[t]he purpose of [Suntio's] invention is achieved by arranging the ribs [i.e., fins] of the cooling element in a layout in which the distance [i.e., spaces] between then is [are] not constant. (¶) The cooling element according to the invention [taught by Suntio], which comprises ribs at a certain distance from one another is characterized in that the width of at least one space between ribs is different at different points." Id. at l. 65-col. 2, l. 4; underlining added for emphasis. This is also clearly & explicitly taught and discussed throughout the Suntio reference, for instance at col. 2, ll. 9-12, 15-16 and 45-56 therein. This explicitly delineated aspect of Suntio's teaching is clearly shown in Suntio's Figures 4 and 5a-5d.

Further, these uneven heat sink fin spacing aspects are distinctly claimed by Suntio. Id. at col. 3, ll. 18-20; col. 4, ll. 12-18.

Applicants respectfully assert that, in explicitly teaching non-constant distance between its cooling element's ribs (Op. Cit.) and that "the width of at least one space between ribs is different at different points" (Op. Cit.), the Suntio reference clearly and expressly teaches away from the claimed embodiments herein, which recite that spacing between heat sink cooling fins is substantially even with respect to each other. For this additional reason, Applicants also respectfully assert that the Suntio reference does not teach or suggest the claimed embodiments recited herein and expresses or implies no motivation to produce these claimed embodiments and that thus, Claims 14, 1 and 9 and their respective dependent claims are allowable over the reference under 35 USC 102(b) and 35 USC 103(a).

Further, Applicants note that Suntio explicitly teaches and expressly claims that cooling elements cool an electronic device passively "by means of convection flow." Id. at col. 3, ll. 15-17; col. 4, ll. 6-8. Suntio also implicitly teaches passive, convection-based cooling throughout, for instance in teaching that:

(1) "Active cooling with fans ... is possible in certain cases, but in most cases cooling takes place by means of the convection of the ambient air or some other medium." Id. at col. 1, ll. 19-22 (underlining added for emphasis);

(2) "The curving ribs and the widening and narrowing spaces can also direct the intake of cooling air ..." (i.e., convectively). Id. at col. 2, ll. 15-17 (underlining added for emphasis); and

(3) "A narrow space between ribs at the component that produces heat causes the air flow to be accelerated fro what it is at the wider parts. On the other hand, the wider space at the lower edge and/or side of the device functions

as a large suction inlet, which suck a lot of cooling air between the ribs." Id. at ll. 51-56 (underlining added for emphasis).

Applicants respectfully assert that this passive, convection-based cooling teachings of the Suntio reference cannot provide the redundant cooling flow benefit that is provided by the claimed embodiments recited herein.

Applicants respectfully assert that, in teaching passive, convection-based cooling flow, Suntio teaches away from the claimed embodiments recited herein, which relate to providing cooling flow streams with motive force from each as the discharge of multiple fans disposed and directing these discharges towards heat sink cooling fins, e.g., active cooling, in plain contrast to the passive cooling explicitly & implicitly taught and expressly claimed by Suntio.

For this additional reason as well, Applicants respectfully assert that the Suntio reference does not teach or suggest the claimed embodiments recited herein and expresses or implies no motivation to produce these claimed embodiments and that thus, Claims 14, 1 and 9 and their respective dependent claims are allowable over the reference under 35 USC 102(b) and 35 USC 103(a).

CONCLUSION

By the rationale stated above, Applicants respectfully assert that the references cited do not teach or suggest the embodiments of the present invention as recited in Claims 1, 9, and 14, as amended herein, and their respective dependent Claims and therefore, that these claims are allowable over the cited references under 35 USC §§102(b) and (e) and 35 USC §103(a).

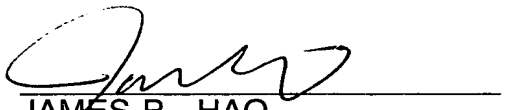
Accordingly, Applicant respectfully request that the rejection of Claims 1-5, 8-11, 13-14, 16 and 18-19 under 35 USC §§102(b) and (e) and/or under 35 USC §103(a) be withdrawn and that Claims 1-5, 8-11, 13-14, 16 and 18-19 be allowed.

Please charge deposit account No. 08-2025 for any unpaid fees.

Respectfully submitted,

WAGNER, MURABITO & HAO, LLP

Dated: 8/25, 2005



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